FRIENDS OF ORNITHOLOGY

Newsletter

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Grus, The Crane (Willughby & Ray 1678)

UNIVERSITY OF ALASKA MUSEUM OF THE NORTH

From the Curator

Kevin Winker

During the last academic year I enjoyed taking some time away from the majority of my normal duties for a sabbatical. I mostly stayed here in Fairbanks, but the ability to focus on a series of long-neglected projects and learning opportunities helped recharge my mental batteries. On most days I worked at home writing and reading in the mornings and came in to work in the afternoons. It turned out to be a good way to make new strides, to push old projects to completion, and yet still keep up with a busy department and the museum during a period of transition.

One reason for coming in every day was to do email and to find and obtain additional references for the manuscripts I was working on. We're not hooked up to the internet at home. This decision was initially made to allow us to really get away from the office when we come home, and it works fairly well in that way. But over the years an additional benefit has become apparent. I can't read anything in depth at work, and it's hard to write productively—but it's easy to both at home. Not only are there fewer interruptions, it is more difficult to interrupt myself by checking email or by click, click, clicking my way through internet pages of transient interest and relevance. It is too easy to read all you can find about the idiosyncracies of some particular way to analyze a dataset, or to participate in interesting email conversations that aren't materially advancing one's daily agenda in science and education. The internet is a wonderful tool, but it does affect how I focus and use my time. When I need it, it's just six miles away. The forced separation has materially enhanced productivity this past year. I recommend disconnecting for several hours a day to everyone who needs to finish things that require time and focus.

Some exciting developments occurred during the year on student projects, which you will see below. As in past years, it has been support like yours that has kept our students moving forward in their endeavors. This year the Friends of Ornithology have supported students through stipends (with a Federal work-study match), field travel, and research laboratory costs. We all thank you for your support, which continues to be both needed and much appreciated.

Students from the Watershed School's 6th grade class look on as Kyle Campbell prepares a specimen. (M. Guthrie)

The Department of Ornithology

Although our existence and many of our activities are centered around the Bird Collection, it is the people involved who make it all happen:

Residents

Kevin Winker (Curator)
Jack Withrow (Collections Manager)
Brina Kessel (Curator Emeritus)

Students

Jack Withrow (MS student)
Kyle Campbell (MS student)

Research Associates

Heinrich Springer	*Johannes Erritzoe*
Rose A. Z. Meier	*Kevin McCracken*
Christin Pruett	*Thomas Braile*
Daniel Gibson	*Matthew Miller*

Volunteers

David Sonneborn	*Luke DeCicco*
Steven Heinl	*Michael Schwitters*

FROM STAFF, STUDENTS, ETC.

Jack Withrow

The last year has been a productive year in the Department of Ornithology. Spring fieldwork produced many good birds, including the first and third North American records of Solitary Snipe, *Gallinago solitaria*, and Pin-tailed Snipe, *Gallinago stenura*, respectively. With the closure this year of the Attu Island LORAN station, fieldwork in the Near Islands will be curtailed in the future, an unfortunate event given that area's importance as a sampling location. It is likely that it will never again be as convenient to conduct fieldwork in that far-flung corner of Alaska. A short paper on important recent bird records from this fieldwork will be published in *Western Birds* next year.

Since Kevin's return from sabbatical, the bird lab has again starting having regular 'skinning nights,' when interested members of the public, students, and ornithology staff get together and spend an evening processing bird specimens. These informal gatherings help address the backlog of frozen birds not yet prepared. We get a lot of specimens from throughout the state that people find dead and send to us. These skinning nights have also been helpful in recruiting volunteers who participate more regularly in specimen preparation.

Just last month we completed the re-sorting, re-housing, and full databasing of our tissue collection, the eighth largest collection of vouchered bird tissues in the world. Most of it is now housed in vapor-phase liquid nitrogen, a highly stable environment both thermally and in terms of equipment longevity. Completing this process was a huge undertaking, requiring physically handling and entering data for roughly 75% of the ~40,000 vials in this collection (we save more than one vial per bird). The newer system is highly efficient with respect to cryogenic space, and our samples can now be retrieved in seconds or at most minutes. This is very important because it is one of the most heavily used parts of the bird collection.

As always, we appreciate any dead birds you may encounter and salvage for science. This salvaged material continues to be an important part of the collection and of our outreach program. If you are not in Alaska, there may be another repository nearby willing to accept any dead birds that you find.

As Alaska's bird specimen repository, we have much to look forward to in the coming year.

Attu Island airstrip and LORAN station. (J. Withrow)

Kyle Campbell

A few weeks ago, as over seven hundred visitors wandered in and out of the Ornithology lab, it occurred to me that this was the fourth annual Halloween Museum Open House that I've been part of. This year I prepared a Black Vulture (*Coragyps atratus*), an appropriate bird for a Halloween demonstration and the same species I prepared during my first Halloween Open House at the Museum in 2007. I first started working in the Ornithology lab as an undergraduate volunteer, and now that I am pursuing graduate studies on the genetics of birds from the Philippines, I still find these opportunities to interact with the public and showcase the work we do to be very rewarding. I always enjoy watching the visitors' reactions as they observe us preparing museum study skins, and although some seem more or less appalled by the "messy" nature of what we do, the vast majority seem intrigued, fascinated, and inspired to learn more about birds. For me, this is perhaps one of the most gratifying aspects of working with the Museum's bird collection; any opportunity to use the bird collection to excite others about the marvels of avian diversity is one I readily take advantage of.

For this reason it is no surprise that I jumped at the opportunity to participate in a National Science Foundation-sponsored teaching fellowship this year, one that enables me to work alongside K-12 teachers in their classrooms and foster the same kind of excitement and scientific curiosity in children that I see whenever visitors come into the bird lab at the museum. The fellowship, called CASE: GK-12 (Changing Alaska Science Education: Graduate students in K-12 Education), brings graduate students from science, technology, engineering, and math into K-12 classrooms to improve graduate students' abilities to communicate their science to a broader public and to provide K-12 teachers and students with opportunities to interact with research scientists. The time I spend working in the classroom has proven to be incredibly rewarding and fun! Recently I participated in a debate on climate change with a class of 6th graders that marked the completion of a 10-week unit on weather, climate, and atmospheric processes, and I was impressed and encouraged with some of the original opinions and suggestions for the future posited by the students. In addition to working in the classroom with students and teachers, as part of my fellowship I am currently preparing education kits that will be available at the Museum for checkout by any teacher or educator in the Fairbanks Northstar Borough School District.

The education kits I am preparing will not only provide hands-on learning experiences for K-12 students and familiarize them with common Alaska birds, but they will also provide teachers with grade-appropriate activities and lesson plans that meet the Alaska Content Standards adopted by the Alaska State Board of Education. Each year, dozens if not hundreds of salvaged birds are sent to the UA Museum; many of them are vehicle or window casualties, while others are culled from runways as part of Bird Aircraft Strike Hazard programs around the state. Although these salvaged birds often represent important and valuable additions to the bird collection, we receive large numbers of common bird species that are excellent candidates for other uses, like education.

I try to make the most of each of the birds going into the education kits, preparing them as either spread wings with accompanying feet, tails, and skulls, or as complete study skins. Some of the education kits will include enough spread wings of a single species that each student will be able to have their own wing to examine, and after comparing with the rest of the class, the concept of within-species variation will be both tangible and relevant to the students. Other kits will include wings, feet, and skulls of several different species, demonstrating the variation among different species and the incredible diversity of adaptations birds employ to survive. We've had very strong positive feedback from teachers using these education materials. Many students are captivated by this hands-on approach to seeing, touching, and closely studying birds.

This semester I have also been working with Jack Withrow to train undergraduate students taking the course "Survey of Wildlife Science" to prepare museum study skins. Several of these

students have enjoyed the experience so much that they are now volunteering to help me prepare birds for the education kits. Like me, these new volunteers were all hooked after their first visit to the bird lab. It's been really fun for me to watch the volunteers' interest in birds increase with each visit to the lab and with each new bird they prepare. In some ways I am even reminded of how I felt when I prepared my first Black Vulture four Halloweens ago.

ANNUAL REPORT - ORNITHOLOGY FY10

The Department of Ornithology continued to have a high level of productivity this fiscal year. Kyle Campbell began his Masters program with us. Department personnel conducted five field efforts, two in Alaska (Kodiak and Attu Island), two in the Philippines, and one in Russia. Staff and students were involved with ten scientific presentations at five different meetings, including the American Ornithologists' Union meeting in Philadelphia, Pennsylvania. Fully 21 publications appeared with students or staff as authors, and the collection grew by 1,500 specimens. As always, we salute our remarkable volunteers and the Friends of Ornithology, without whom we would not be able to accomplish nearly as much.

Volunteer hours	2,626
Acquisitions	1,500
Grants	4
Publications	21
Reports	16
Loans	15
Data requests	154
Professional visitors	31
Student visitors	62
Public contacts	~820

Students working with collections

PhD	5
MS	5

McKay's Bunting

Kevin Winker

When I arrived in Alaska in 1997 I thought that McKay's Bunting (*Plectrophenax hyperboreus*) was probably just a subspecies of the Snow Bunting (*P. nivalis*). But I was wrong. What I thought were relatively minor plumage differences turned out to be much more profound. With the support of the National Science Foundation (NSF) and the Alaska Maritime National Wildlife Refuge (AMNWR), I had the opportunity to go to St. Matthew Island in 1997. The main focus was to get a close look at McKay's Bunting and to obtain specimens, including the first vouchered genetic material of the species. McKay's Bunting is the highest latitude endemic songbird in the world, and it only breeds on St. Matthew Island and nearby Hall Island, a very remote area in the Bering Sea. It had been many years since scientists had been on these islands.

I flew out to St. Paul Island in the Pribilofs to catch the refuge's research vessel the Tiglax, which was scheduled to drop groups of researchers onto both St. Matthew and Hall islands. The Tanadgusix (TDX) Corporation on St. Paul kindly issued me a permit to collect specimens there, too, which turned out to be more important than I thought it would be for our understanding of McKay's Buntings.

Baby birds wear what is called juvenal plumage when they leave the nest and before they have their first prebasic molt, which usually begins within a week or two after they fledge. Because this plumage is worn for such a brief time, birds in juvenal plumage are relatively rare in collections. It turned out that the juvenal plumage of McKay's Buntings had never even been described. I took some juvenal Snow Buntings on St. Paul right before boarding the vessel for St. Matthew, and when we arrived at our destination I took some juvenal McKay's Buntings. I immediately noticed that they were much paler than juvenal Snow Buntings. So I made sure that we obtained adequate sample sizes of birds in juvenal plumage as well as adults so that we could compare genotype and phenotype (in this case juvenal feather coloration) between Snow and McKay's buntings.

James Maley subsequently led this effort and fleshed out the details for his Masters thesis. The first paper from his thesis was published in *The Auk* in 2007 and focused on juvenal plumage using all of the specimens available (including many more than 100 years old). Using reflectance spectrophotometry, the two species are completely separable visually and

Juvenal McKay's (top) and Snow (bottom) buntings. (D. Shaw)

statistically based on their juvenal plumage, but different subspecies of Snow Bunting are not. We interpreted these results to support the present taxonomic status of McKay's Bunting as a full species.

The genetic data revealed a much richer historical perspective, and that appeared recently in *Molecular Ecology*. Past glacial cycles have had profound influences on organisms in Beringia, making this region a natural laboratory for studying the process of speciation. Genetic data enable us to look back in time and understand how a lineage was affected by events like glaciations and how lineages split off from relatives. We used nuclear and mitochondrial genetic data to obtain complementary information with strengths at different temporal depths.

The genetic past of McKay's Buntings suggests that a small ancestral group arrived in Beringia during the last glacial maximum (LGM) and, in isolation, became differentiated from Snow Buntings. Before the glaciers of the LGM melted, McKay's Buntings had an apparently large population, probably spread broadly across Beringia. With the loss of the glaciers, however, their isolation from Snow Buntings ended, and there is a genetic signature of Snow Buntings arriving and crossbreeding on a massive scale, genetically inundating the formerly large population of McKay's Buntings. Sea level rise, which drowned the Bering Land Bridge, shrunk the formerly large range of McKay's Bunting to just St. Matthew and Hall islands. There, we surmise that their early arrival time in spring and their very high breeding densities have kept them sufficiently isolated from Snow Buntings to retain species status by keeping hybridization levels low. The genetic data allowed us to uncover this history and to estimate the timeframe of major events, and so we now know much of the bunting story, including the fact that McKay's Bunting is one of the youngest species in North America. Support from the Friends of Ornithology was integral to the completion of this project.

FRIENDS OF ORNITHOLOGY

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www.universityofalaskamuseumbirds.org

RECENT PUBLICATIONS (ANNOTATED)

(**Bold** denotes our students)

Miller, M. J., E. Bermingham, J. Klicka, P. Escalante, and K. Winker. 2010. Neotropical birds show a humped distribution of genetic diversity along a latitudinal transect. Ecology Letters 13:576-586. *The latitudinal gradient in species richness is ubiquitous, and within-population genetic diversity also often increases towards the Equator. Explanations for the latter include post-glacial, poleward range expansion or that the two phenomena are responding to similar processes. This is the first study to examine the relationship between latitude and within-population genetic diversity in tropical species. We surveyed population genetic variation in nine bird species along the corridor of Neotropical lowland forest from southern Mexico to western Ecuador, where avian species richness increases with decreasing latitude. Within-population genetic variation was always highest at mid-range latitudes, not in the most equatorial populations. Differences in population size and stability across species' ranges might explain some of our results, but much of the pattern may be due simply to geometric constraints. Our findings have implications for conservation planning and for understanding how biological diversity scales from genes to communities.*

Maley, J. M., and K. Winker. 2010. Diversification at high latitudes: Speciation of buntings in the genus *Plectrophenax* inferred from mitochondrial and nuclear markers. Molecular Ecology 19:785-797.

Winker, K., and S. M. Haig (eds.). 2010. Avian subspecies. Ornithological Monographs 67:i-viii, 1-200. *An edited monograph of 14 chapters representing the first thorough treatment of subspecies in decades.*

Winker, K. 2010. Subspecies represent geographically partitioned variation, a goldmine of evolutionary biology, and a challenge for conservation. Ornithological Monographs 67:6-23. *This review summarizes the history of the subspecies concept and the major issues surrounding its use, with an emphasis on ornithology, in which the concept originated. The study of subspecific variation in birds has been an important driving force in the development of evolutionary biology. Subspecific study has also been essential in the description and preservation of biodiversity. Although controversial, subspecies continue to play an important role in both basic and applied science. Ten issues have been largely resolved during the 150-year controversy. These include nomenclature, sampling theory, evolutionary biology, and the heterogeneity of named subspecies. Three big unresolved questions and philosophical issues remain: What are subspecies; how do we diagnose them; and what does subspecific variation mean? Discordance between genotypic and phenotypic data at these shallow evolutionary levels should be expected. The process of diagnosing states that exist along a continuum of differentiation can be difficult and contentious and necessarily has some*

arbitrariness; professional standards can be developed so that such diagnoses are objective. Taxonomies will change as standards do and as more data accrue. Given present evidence, our null hypothesis should be that subspecific variation probably reflects local adaptation. In looking forward, it seems assured that geographically partitioned variation—and the convenient label subspecies—will continue to play an integral role in zoology.

Haig, S. M., and K. Winker. 2010. Avian subspecies: Summary and prospectus. Ornithological Monographs 67:172-175.

Pruett, C. L., and K. Winker. 2010. Alaska Song Sparrows (*Melospiza melodia*) demonstrate that genetic marker and method of analysis matter in subspecies assessments. Ornithological Monographs 67:162-171.

Pruett, C. L., T. N. Turner, C. M. Topp, S. Zagrebelny, and K. Winker. 2010. Divergence in an archipelago and its conservation consequences in rock ptarmigan. Conservation Genetics 11:241-248. *Identification and assessment of island endemics is a conservation priority. We genotyped 215 Rock Ptarmigan (*Lagopus muta) *from five populations in the Aleutian-Commander archipelago and two Alaska mainland populations to identify conservation units, assess genetic diversity and gene flow, and to determine whether populations have declined over time. We found four distinct populations that appear to be completely isolated and correspond closely with subspecies.*

Winker, K., and D. D. Gibson. 2010. The Asia-to-America influx of avian influenza wild bird vectors is large. Avian Diseases 54:477-482. *Recent literature has underestimated the number and taxonomic diversity of wild birds moving annually between Asia and North America. Our analyses of the major avian influenza (AI) host groups show that fully 33 species of waterfowl (Anatidae), 46 species of shorebirds (Charadriidae and Scolopacidae), and 15 species of gulls and terns (Laridae) are involved in movements from Asia to Alaska across northern oceans. Our data suggest that about 1.5 - 2.9 million individuals in these important host groups move from Asia to Alaska annually.*

Winker, K. (ed.). 2010. Moments of Discovery: Natural History Narratives from Mexico and Central America. University Press of Florida, Gainesville. 402 pp. *This volume is about biological explorations in Middle America, from Mexico to Panama. Its purpose was to capture some of the wonderment and history of these explorations, and it does so in 20 autobiographical accounts. The authors represent seasoned Neotropical hands, and most experienced things during their work that make for the tales of a lifetime. These entertaining and illuminating events rarely appear in written reports or scientific papers. Thus, some of the most exciting aspects of biological exploration are not recorded, but rather live, for a time, in the oral history of the profession. Humorous and incongruous situations, captivating people, places, and wildlife, moments of discovery, and the inevitable trials provide the essence of this rich history.*

Winker, K. 2010. Studying the birds of Los Tuxtlas. Pp. 335-370 *in* Moments of Discovery: Natural History Narratives from Mexico and Central America (K. Winker, ed.). University Press of Florida, Gainesville.

Humphries, E. M., and K. Winker. 2010. Working through polytomies: Auklets revisited. Molecular Phylogenetics and Evolution 54:88-96. *We used the* Aethia *auklet polytomy to examine different methods for resolving such systematic problems: mitochondrial DNA gene choice, number of individuals per species sampled, model of molecular evolution, and AFLP loci. We recovered a fully-resolved phylogeny using NADH dehydrogenase subunit 2 (ND2) sequence data. Additional sampling within species was effective; 20% of subsampled datasets failed to return a congruent phylogeny when only one or two individuals per species were included. We did not recover a resolved phylogeny using AFLP data; AFLPs may not be useful at the genetic depth of the* Aethia *auklet radiation (7–9% divergent in ND2).*

Russian colleague Anna Zaykovskaya succeeds in getting an export permit.

Humphries, E. M., J. L. Peters, J. E. Jonsson, R. Stone, A. D. Afton, and K. E. Omland. 2009. Genetic differentiation between sympatric and allopatric wintering populations of Snow Geese. Wilson Journal of Ornithology 121:730-738.

McCracken, K. G., C. P. Barger, M. Bulgarella, K. P. Johnson, S. A. Sonsthagen, J. Trucco, T. H. Valqui, R. Wilson, K. Winker, and M. D. Sorenson. 2009. Parallel evolution in the major haemoglobin genes of eight species of Andean waterfowl. Molecular Ecology 18:3992-4005.

McCracken, K. G., C. P. Barger, M. Bulgarella, K. P. Johnson, M. K. Kuhner, A. V. Moore, J. L. Peters, J. Trucco, T. H. Valqui, K. Winker, and R. E. Wilson. 2009. Signatures of high-latitude adaptation in the major hemoglobin of five species of Andean dabbling ducks. American Naturalist 174:631-650.

Rocque, D. A., M. Ben-David, R. P. Barry, and K. Winker. 2009. Wheatear molt and assignment tests: ongoing lessons in using stable isotopes to infer origins. Journal of Ornithology 150:931-934. *Using stable isotopes from feathers to determine where they were grown geographically remains an exercise fraught with problems and uncertainties. We clarify a conundrum with Northern Wheatear molt and briefly review the status of isotope-based assignments of individual birds to breeding and wintering areas.*

Winker, K. 2009. Reuniting genotype and phenotype in biodiversity research. BioScience 59:657-665. *Studying biological diversity using phenotype has become less popular than doing so using genetics. Results using the two approaches often disagree at the species level and below. However, because in today's datasets phenotypic divergence is probably driven mostly by selection and genetic divergence by stochastic processes, we should not expect them to be tightly coupled at population-to-species evolutionary depths. It is useful to consider phenotypic and genetic data as largely unidimensional axes in an inherently multidimensional process. Phenotypic and genotypic datasets might give very different views of evolutionary trajectories in adaptive and nonadaptive space. Integrating them provides a roadmap for theoretical and empirical research, and such integration is providing important insights into the units of biodiversity and the processes responsible for their generation.*

Stoeckle, M. and K. Winker. 2009. A global snapshot of avian tissue collections: State of the enterprise. Auk 126:684-687. *The first species-level survey of the world's avian genetic collections (available as an online Appendix). The UAM Bird Collection ranked as the 8th-largest in the world.*

Winker, K. 2009. [Review of] Handbook of the birds of the world, Vol. 13: Penduline-tits to Shrikes. Loon 81:105-107.

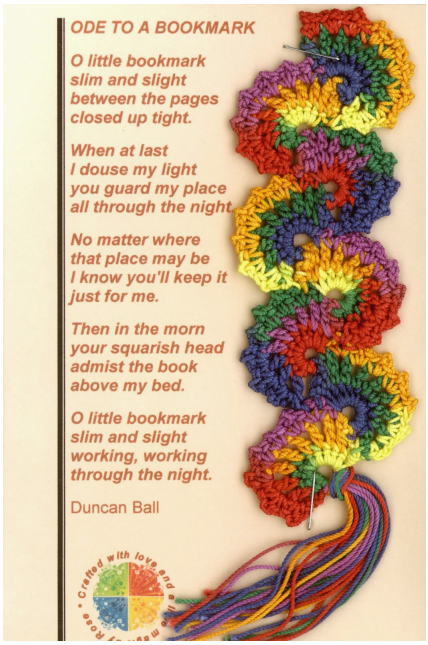
AOU Committee on Bird Collections (Winker is lead author of 8). 2009. Basic standards for bird collections. Auk 126:941-942.

AOU Committee on Classification and Nomenclature (Winker is one of 11 members). 2009. Fiftieth supplement to the American Ornithologists' Union Check-list of North American Birds. Auk 126:705-714.

Gibson, D. D., S. C. Heinl, A. J. Lang, and T. G. Tobish, Jr. 2010. Checklist of Alaska birds, 16th edition.

If you are interested in reading these papers, most can be found on our web site (Winker's CV site).

Hand-crocheted bookmarks are being made by a member for sale on behalf of the Friends. Current price is $9, shipping included. To purchase, contact the Friends via kevin.winker@alaska.edu



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